

Do the Frequency of Ankle Joint-Related Pathologies Concomitant to Chronic Ankle Instability Vary According to Age and Gender?

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Abstract

Background: To determine the distribution of intra-articular lesions according to age and gender by retrospectively examining the archive records of patients who were operated due to ankle instability.

Methods: The patient records of ankle arthroscopy procedures from between February 2009 to February 2020 were retrospectively evaluated. The information about patients such as age, gender, surgical site, intra-articular and surrounding lesions (osteochondral defects, degenerative cartilage changes, synovial disorders, impingement syndromes, flexor hallucis longus lesions and the presence of os trigonum) were noted and compared statistically.

Results: The incidence of concomitant intra-articular pathology was found to be 78.2% in patients who underwent ankle arthroscopy due to instability. Anterior impingement syndrome in 74.5% of patients, osteochondral lesion in 41.2%, synovial hypertrophy in 15.8%, and degenerative arthritis in 9.1% of the patients were detected. The mean age of the patients with anterior impingement syndrome (p: 0.012), osteochondral defect (p: 0.001), and degenerative arthritis (p: 0.003) was found to be significantly higher than those without. The mean age of patients without additional pathology was 33.91±12.08, patients with an additional pathology were 37.77±12.35, and patients with more than one pathologies were found to be 42.15±11.79 (p: 0.003).

Conclusions: The most important finding of this study was that the presence and number of pathologies accompanying ankle instability increased with age. Considering the incidence of concomitant lesions in patients to be operated due to chronic ankle instability, detailed evaluation of preoperative magnetic resonance imaging and performing diagnostic arthroscopy may be beneficial for determining the possibility of concomitant lesions.

Key words: Ankle Instability, Age Distribution, Osteochondral Defects, Anterior Impingement Syndrome.

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Introduction

Intra-articular pathological lesions concomitant to chronic ankle instability are increasingly recognized and treated. Clinical studies report that more than 50% of patients with chronic ankle instability are accompanied by an intra-articular pathology (1). Moreover, it has been reported that 13-35% of patients has residual pain after successful ligament reconstruction. Ongoing pain is thought to be caused by accompanying intra-articular lesions (2). Intra-articular pathologies which frequently accompany chronic lateral ankle instability have been reported as tenosynovitis, anterolateral impingement lesion, attenuated peroneal retinaculum, ankle synovitis, intra-articular loose body, and osteochondral lesions (3, 4).

It has been reported in previous studies that increased age and female gender could be an indicator of poor prognosis after an ankle sprain. However, information on this subject is still believed to be insufficient; thus, it is recommended that clinical decisions for this group of patients should be made cautiously (5). In another study on chronic ankle instability, the mid-term clinical results of the surgery were discussed and it was shown that the presence of cartilage related lesions in older patients was associated with poor clinical outcome(6). Although magnetic resonance imaging is successful in detecting intra-articular lesions, the gold standard diagnostic method is still advocated to be diagnostic arthroscopy by many authors (7).

The aim of the present study was to determine the distribution of intra-articular lesions according to age and gender by examining the archive records of patients who were operated due to ankle instability retrospectively.

Materials and Methods

Hospital data files and video recordings of ankle arthroscopy - endoscopy procedures of patients between February 2009 and February 2020 were evaluated retrospectively. Patients who were operated due to ankle instability were included in the study and individuals under the age of 18, patients with insufficient archive records, ankle deformity, or a history of fractures were excluded from the study. Among the 682 ankle arthroscopy patients evaluated, 221 were found to meet the inclusion criteria. Fifty-six patients who met the exclusion criteria were excluded from the study. Age, gender, surgical side, intra-articular and surrounding lesions (osteochondral defects, degenerative cartilage changes, synovial

disorders, impingement syndromes, flexor hallucis longus lesions and the presence of os trigonum) were noted for all 165 patients. The study was conducted in accordance with the principles of the Declaration of Helsinki and the protocol was approved by the ethics committee from the institute of the current study (Date:14.07.2020; Decision Number: 07)

All arthroscopic interventions were performed by the same surgical team and each procedure was started with a step-by-step arthroscopic examination of the ankle. After inserting the camera through the anteromedial portal to the ankle, the lateral gutter (ATFL's superior fascicle, resident's fibular tip), lateral talar dome, medial talar dome, medial gutter (deep layer of deltoid ligament, anterior tibiotalar ligament, the tip of the medial malleolus) and the medial tibial angle (notch of Henry) and anterior tibial rim were examined respectively. Detection of intra-articular pathologies was achieved by retrospective examination of arthroscopic examination in video recordings. Posterolateral and posteromedial portals were used in posterior ankle endoscopy, and endoscopic examination was performed after debridement.

Statistical analysis was performed using IBM SPSS Statistics, Version 23.0 (IBM Corp., Armonk, NY, USA), and a value of $p < 0.05$ was considered statistically significant. Categorical variables were presented as numbers and percentages in statistical analysis, and continuous variables were presented as mean \pm standard deviation (SD) in descriptive analysis. Chi-square tests were used to compare categorical variables in independent groups. The suitability of continuous variables to normal distribution was evaluated using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov / Shapiro-Wilk tests). For independent variables, a t-test was used for comparing data sets with normal distribution, and the Mann-Whitney U test was used for variables that did not show normal distribution. In the case of 3 or more groups, analysis of continuous variables was performed using ANOVA for normal assumptions and the Kruskal-Wallis test for nonparametric assumptions.

Results

The mean age of 67 male and 98 female patients included in the study was calculated as 38.8 ± 14.4 years (range: 18 - 67 years). The incidence of concomitant intra-articular pathology was found to be 78.2% in patients who underwent ankle arthroscopy due to instability.

While 35.2% of the patients had pathology in addition to instability, 43% had more than one joint-related pathology. Anterior impingement syndrome in 74.5% of patients, posterior impingement syndrome in 9.7%, osteochondral lesion in 41.2%, synovial hypertrophy in 15.8%, degenerative arthritis in 9.1%, os trigonum in 3.6%, and flexor hallucis longus tendinitis in 2.4% was detected.

The mean age of the patients with anterior impingement syndrome (p: 0.012), osteochondral defect (p: 0.001) and degenerative arthritis (p: 0.003) as an additional pathology was found to be statistically significantly higher than those without (Table 1). When osteochondral defect patients were examined, it was observed that the mean age of 55 patients with medial lesions was 45.16 ± 10.72 and 31.81 ± 15.69 in patients with lateral lesions. There was also one patient with both medial and lateral lesions. This difference was statistically significant (p < 0.001). The mean age of 15 patients with degenerative arthritis was 47.73 ± 13.84 , while that of the others was 37.92 ± 11.94 (p:0.003).

Table 1: Differences in mean age according to the presence of ankle joint-related lesions

	Absent	Present	p value
Anterior Impingement Syndrome	34.69±12.57	40.22±12.08	0.012*
Posterior Impingement Syndrome	38.54±12.41	41.37±12.48	0.388
Talus Osteochondritis Dissecans	36.09±11.67	42.70±12.47	0.001*
Presence of Os Trigonum	38.64±12.34	43.50±14.52	0.348
Ankle Degenerative Arthritis	37.92±11.94	47.73±13.84	0.003*
Synovial Hypertrophy	38.48±11.94	40.61±11.80	0.423
*Independent samples t test			

Thirty-six (21.8%) patients had no additional pathology other than instability, fifty-five (33.3%) had one additional pathology, 69 (41.8%) patients had two additional pathologies, and the other 5 (3%) patients had more than two pathologies. When the distribution of patients by age was examined, the mean age of patients without

additional pathology was 33.91 ± 12.08 , patients with an additional pathology were 37.77 ± 12.35 , and patients with two or more additional pathologies were found to be 42.15 ± 11.79 (Table 2, p: 0.003). No statistically significant correlation was found between gender and surgical side and variables (p>0.05).

Table 2: Distribution of intra-articular pathologies accompanying symptomatic acromioclavicular joint degeneration for all patients based on age groups

	Absent	Present	p value
Concomitant pathology	33.97±12.07	40.17±12.20	0.008*
Only one concomitant pathology	33.91±12.08	37.77±12.35	0.140
>1 concomitant pathology	33.91±12.08	42.15±11.79	0.001*
*Independent samples t test			

Discussion

In the present study, ankle arthroscopy and posterior ankle endoscopy records of the patients who were operated due to ankle instability were evaluated and an accompanying joint-related pathology was found in 78.2% of the patients. Anterior impingement syndrome and osteochondral defects were found to be the most common accompanying lesions to instability, and the incidence of mentioned lesions increased with age.

It was also found that the mean age of patients with more than one lesion was statistically higher than patients with an additional lesion and patients with an additional lesion than patient without additional lesions. To the best of our knowledge, the present study was the first to investigate the relationship between lesions associated with chronic ankle instability and demographic variables. Also, there was no relationship between gender and variables.

Ankle lesions often coexist and joint-related lesions accompanying chronic ankle instability are common sources of pain and morbidity for patients. Osteochondral lesions, anterior or posterior impingement syndromes and peroneal region problems are common in that group of patients (8).

Anterior ankle impingement can be caused by osteophytes or soft tissue impingement and is clinically seen with limited ankle dorsiflexion and ankle pain. Impingement rates are reported in a wide range in the literature. While osteophytes are present in 11-26% of chronic ankle instability cases, soft tissue compression is observed in 14-82% (9, 10). In the present study, anterior impingement syndrome could be observed in 74.5% of the group, while 83.7% of the patients only had a soft tissue lesion; with 16.3% having both bone and soft tissue impingement pathologies.

The incidence of chondral lesions as a concomitant lesion of ankle instability is reported to be 22-95%, while the incidence of osteochondral lesions is 7-23%. In the present study, osteochondral lesions and chondral degeneration were evaluated and detected in 41.2% and 9.1% of the patients, respectively. The reason for the higher incidence of the osteochondral lesions in our study compared to the percentages reported in the literature could be due to the higher mean age of the patients who were included in the present study (The mean age of Choi et al's study: 27.0, Present Study:38.8) (2, 11).

There were several limitations to the present study due to the retrospective design. The severity of the lesions, the activity levels of the patients, the duration of clinical symptoms and the effect of surgical intervention on clinical outcomes were not evaluated in the present study. Since the evaluation was made only with ankle arthroscopy and posterior ankle endoscopy video recordings, the presence of lesions such as peroneal tendon problems and nerve entrapments outside the examination area could not be evaluated.

In conclusion, the most important finding of the present study was that the presence and number of pathologies accompanying ankle instability were higher with age. Considering the incidence of concomitant lesions in patients to be operated due to chronic ankle instability, a detailed evaluation of preoperative magnetic resonance imaging and performing diagnostic arthroscopy should be beneficial for determining the possible lesions.

Declarations

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References

1. Yasui Y, Murawski CD, Wollstein A, Kennedy JG. Reoperation rates following ankle ligament procedures performed with and without concomitant arthroscopic procedures. *Knee Surg Sports Traumatol Arthrosc* 2017;25(6):1908-15.
2. Choi WJ, Lee JW, Han SH, Kim BS, Lee SK. Chronic lateral ankle instability: the effect of intra-articular lesions on clinical outcome. *Am J Sports Med* 2008;36(11):2167-72.
3. Hintermann B, Boss A, Schäfer D. Arthroscopic findings in patients with chronic ankle instability. *Am J Sports Med* 2002;30(3):402-9.
4. BF DI, Fraga CJ, Cohen BE, Shereff MJ. Associated injuries found in chronic lateral ankle instability. *Foot & ankle international* 2000;21(10):809-15.
5. Thompson JY, Byrne C, Williams MA, Keene DJ, Schlüssel MM, Lamb SE. Prognostic factors for recovery following acute lateral ankle ligament sprain: a systematic review. *BMC Musculoskelet Disord*. 2017;18(1):421.
6. Jiang D, Hu YL, Jiao C, Guo QW, Xie X, Chen LX, et al. [Mid-to-long term outcomes and influence factors of postoperative concurrent chronic ankle instability and posterior ankle impingement]. *Beijing Da Xue Xue Bao Yi Xue Ban* 2019;51(3):505-9.
7. O'Neill PJ, Van Aman SE, Guyton GP. Is MRI adequate to detect lesions in patients with ankle instability? *Clin Orthop Relat Res*. 2010;468(4):1115-9.
8. D'Hooghe P, Joyce C, Hunt K, Kaux J-F. Concomitant injuries in chronic ankle instability. *Clin Res Foot Ankle* 2018;6(3):7.
9. Cannon L, Hackney R. Anterior tibiotalar impingement associated with chronic ankle instability. *J Foot Ankle Surg*. 2000;39(6):383-6.
10. Özer M, Yıldırım A. Evaluation of the Prevalence of Os Trigonum and Talus Osteochondral Lesions in Ankle Magnetic Resonance Imaging of Patients With Ankle Impingement Syndrome. *J Foot Ankle Surg*. 2019;58(2):273-7.
11. Lee J, Hamilton G, Ford L. Associated intra-articular ankle pathologies in patients with chronic lateral ankle instability: arthroscopic findings at the time of lateral ankle reconstruction. *Foot Ankle Spec* 2011;4(5):284-9.